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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

COUNTRY China

SUBJECT Notes on Status of Industrialization.

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1. Chinese firms are able to supply needs for AC and DC motors. No one would attempt to build any size motor larger than 100 KW or 100 HP as there is no equipment in use to require a larger size. There is little call for rotary converters or rotary condensers. All systems in China are small, ... equipment which is in normal usage in the US is just not called for in China. Static condensers are in very limited use because of the difficulty in obtaining sufficient silver or aluminum foil. The 50X1-HUM Aluminum Foil Company was formerly the largest supplier, and only domestic source. This factory also made foil for cigarette packages. There are two document-paper factories in Shanghai with a capacity of five to 10 tons each per day. There is also a paper factory in Hangchow and one in Kaishing. These, too, manufacture only coarse document paper and do not have facilities for making foil.

2. The largest Chinese-built transformer is capable of one thousand KW, however, the majority of transformers in use are under two hundred KW. Material is very scarce and most of it must be imported. Cotton-braided copper wire, silicon steel sheets, porcelain insulators, and transformer oil are the important items which, if cut off from China, would very seriously cripple the economy. Before the Communists came, China imported electrical and mechanical equipment from the Skoda Works in Czechoslovakia and from 50X1-HUM Germany; The Chinese can manufacture good low-voltage insulators and The difficulty, again, is getting insulator 50X1-HUM oil.

3. there is no wire cable factory in China. 50X1-HUM A machinery manufacturing plant operated by the Natural Resources Commission did build diesel engines, each cylinder around 50 HP. They have built machines up

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to 100 HP. There were no working schedules, the plant operators themselves didn't know how many machines were built. There was a great shortage of labor and materials and work was performed as each became available. The Shanghai-Nanking Railway machine shops made some machine tools. This shop at Chang Chow was expanded , and all the equipment from smaller shops throughout the entire area was brought in and consolidated into one large shop. there were machine shops at the Kiangwan Docks in Shanghai, at the Kailan Mining Company in Tientsin, the Chi Hsin Cement Mill in Chingwantao, the Shanghai Cement Company in Shanghai, the Kiangwan Cement Mill in Nanking, and the Wang Chi Kiang Cement Mill in Hankow which was completed in 1949.

4. The quality of imported goods is superior to those manufactured in China, therefore the importance to China's economy of industrial imports is great. All industry has been electrified - flour, cement, cotton, silk, and paper mills, cigarette factories, machine shops and refrigeration plants all depend on sufficient amounts of electrical equipment. The country will have to have additional equipment for expansion, and if industry is to continue at all, a continuous supply of spare parts is needed for maintenance. Most of the plants are either steam or boiler plants and deterioration which began through improper maintenance and in some areas, more years of Communist occupation. parts badly in need were boiler tubes, seamless tubes and high pressure valves. The Communist engineers in charge of these plants don't know how to fit tubes and run them at extremely high temperatures. At the present time, boiler tubes can only be obtained from the Western nations. Czechoslovakia could, and probably does, supply machine parts ad China's needs are very small compared with other industrial nations. In the US, for instance, we speak in terms of 10 thousand items, whereas in China the figure would be in tens. The cost of producing these items is far greater in China where labor is such a big proportion of the cost. Productivity is low because much of the work is manual and because all raw materials must be imported. Chinese engineers and technicians are diligent and responsible and they can "make do" temporarily with almost anything, but continued draining and misuse of equipment under the Communist have wrung them dry. In 1949-50 the Communists imported a great deal of electrical equipment but not in sufficient amounts to counteract the tremendous loss through poor maintenance. Present equipment is very crude and substitutes are used wherever possible. Because of serious shortage, steel is used only in shafts and cylinders where substitutes just cannot be used. Lumber is used for the other parts. China will not be able to continue as an industrial nation if she cannot get alloy steels or produce them herself. She does turn out small amounts now but not nearly enough for her requirements. If the Western nations could agree among themselves not to supply equipment to Communist China they could in effect put up their own Curtain and really isolate China.

5. Silicon steel is the best grade of transformer sheet metal. Low core loss makes it all-important. Czechoslovakia and Germany are the main sources of silicon sheets. I have never heard of transformer sheets being imported from Russia, or for that matter, any important item Russia knows how to manufacture it but transportation capacity at present is a big problem.

6. there are no hydrogen-cooled generators being built in China. There is a ten thousand HP generator brought from Germany in the Shanghai Power Company. If this is not hydrogen-cooled, then there are no such generators in China.

7. For the electrification of coal mining, it is important toconcentrate on these points:

Shaft haulage or hoisting
Mine water drainage
Ventilation in mine shaft

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Illumination in the mine
Charging batteries for portable lights for miners' lamps
General service - machine shop and water supply.

The items most in continuous demand are cast iron pipes, mine boilers and boiler tubes, all of which last only two or three years. Condenser tubes, valves, steel wire, all items for maintenance of mining equipment are important items. Small flashlight bulbs for the miners' caps and pockets and fans for ventilation are important. They may be able to get tungsten wire for these bulbs from Czechoslovakia. And, again, steel. Additional lines must be run for transportation as coal is taken out of the mine. The larger mines have locomotives which require frequent renewal and addition of rails and cars. The Hwa Nan Coal Mine, 130 miles north of Nanking is the largest coal mine in China. It is the only source available within a three hundred mile radius of Shanghai. [redacted] This mine should be able to produce 5000 tons a day, though its power plant with machinery to capacity of 800 KW is now very old.

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8. Chinese railways have not been electrified as yet. China has not become industrialized sufficiently to allow for such expansion. And only on comparatively short routes between two important cities, such as from Shanghai to Nanking and Peiping to Tientsin are the railroads double-tracked. Water transportation is still used more than the railroads.

9. In recent years there have been no new imports of mining equipment, therefore the present equipment is anywhere from 15 to 20 years old. Existing equipment may be either AC or DC, which complicates both operation and maintenance. The trend of thought among engineers is that new equipment should be AC with the exception of the shaft hoist because of speed control and adjustment. There are no electric locomotives for mining operations in use in China. All mine locomotives are run on coal. Diesel motors are not used because diesel oil is too scarce.

10. Chinese engineers fall into three categories:

a. Those who received technical education abroad.

b. Those who are graduates of native universities with experience in shops and plants.

c. Those who have had no technical schooling but have learned their trade by practical experience.

Chinese engineers are capable of copying design, adjusting factors in design to meet new requirements, using machine and other tools available to them which are mostly of very simple operation. The volume of production is bound to be small because of tool capacity and continuous need for raw materials. [redacted] the people in industry realize operations should be mechanized but their equipment is so limited this is impossible. The Chinese have done as much as any people could do with the materials they have to work with. Although many KW hours are produced, there is no increase in generative capacity because they don't have the machines to use it. There is an increasing demand for electrical capacity and the engineers are constantly striving for an increase. The last batch of generative equipment available to China [redacted] eight sets of five thousand KW each - part of the Export-Import Bank loan. One or two are in use in coal mines, two in the Peking Light and Power plant, at least one in the Tientsin Light and Power plant. [redacted]

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11. Immediate prospects for a substantial increase in production of electrical machinery are nil. The country will not be able to turn out trained engineers with sufficient maturity of judgment for another ten years. The older men in China are for the most part in ill health and are not in the mood to develop facilities under the present government. If Russia sends engineers and technicians, heavy industry will develop, but at what rate [redacted] would depend on the number of engineer, and, more important, their abilities. Then, too, growth of the electrical industry

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is limited by capital. The cost of equipment for a small or moderate-sized plant may be as high as US$200 per KW. In addition, servicing of equipment, building of foundations, and the plant site itself may amount to another US$100 per KW. In order to use that KW a great deal of money has to be spent in transmission and delivery of the electricity to industry - approximately an additional US$300. For this reason, growth of electrification of railroads will be slow - about 8% in 10 years. If the present government will put money into heavy indystry, the picture would change, but the National Government never did finance any of this work. All plants and improvements had to come from the earings of existing plants. 50X1-HUM

12. The only difficulty that would be experienced in switching from US to Russian equipment is the problem of transportation. Since there is very little to speak of in the way of equipment now in China, the country could use Russian, German, English, Swedish, American or any other kind of equipment. By special transformers, equipment could be utilized in any area. In Hankow, for instance, both AC and DC currents are in use, and with converters and frequency chargers industry is gradually around to a one current system. However, serious as the transportation situation is, if Russia wants to tie China to her she will not stop at the difficulties of building roads or railroads across Siberia and western China. There may be a stalemate for a few months, but no longer. The Russians have the ability to get things done without anyone's knowing what they are up to and for this reason the transportation problem will be conquered if Russia so desires. 50X1-HUM

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